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Publication date:
2005

Document Version
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

Citation for published version (APA):
Bodum, L., Kjems, E., & Kolar, J. (2005). *GRIFINOR: An Object-Oriented Approach to Geovisualization for 3D City Models*.

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GRIFINOR

An Object-Oriented Approach to Geovisualization for 3D City Models

By

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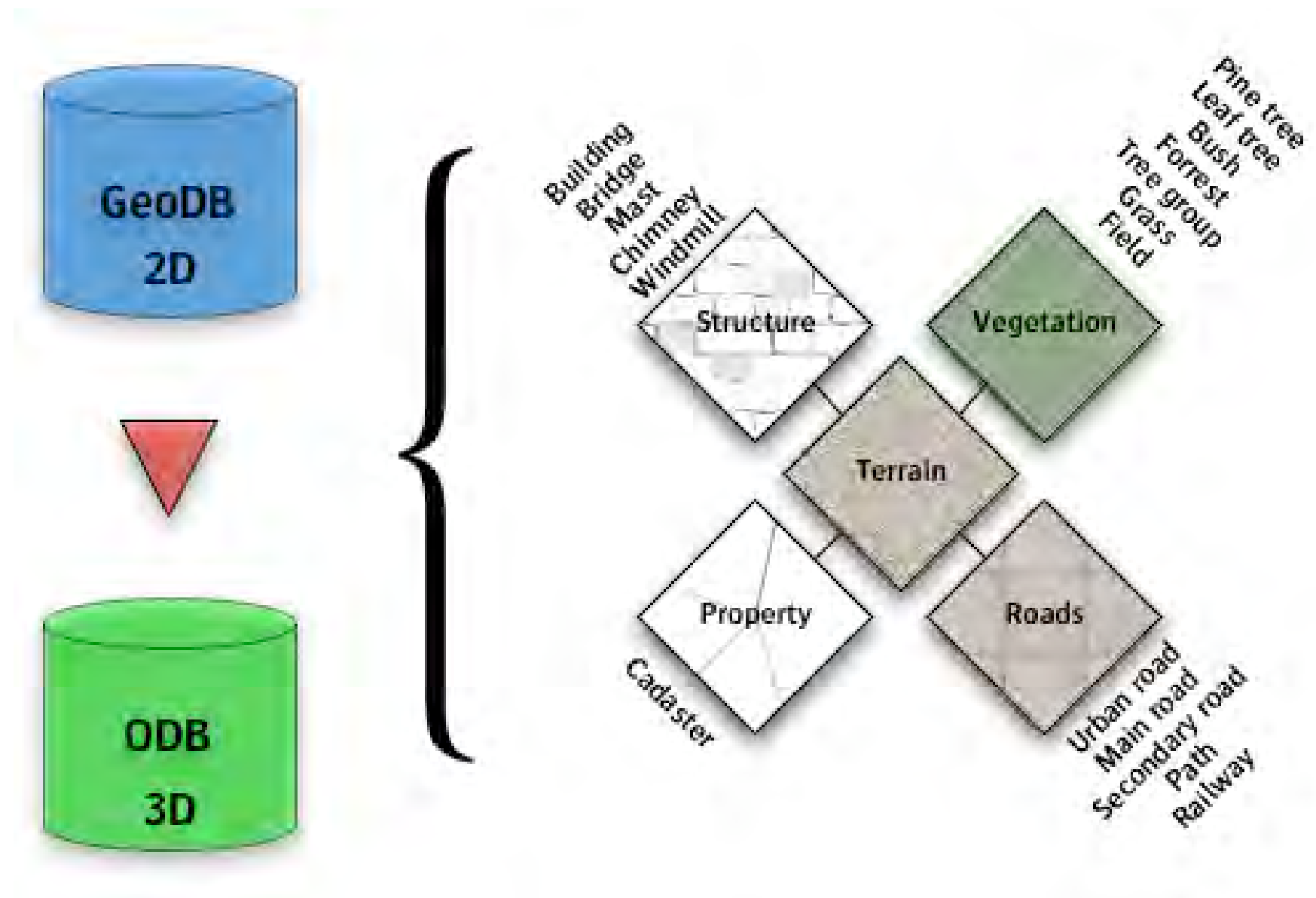
Overview

- What is GRIFINOR?
- System overview
- Index for Distributed Spatial Object (DSO-index)
- Topographic surface representation indexed using global grid
- Geo-embedded visual navigation
- Summary

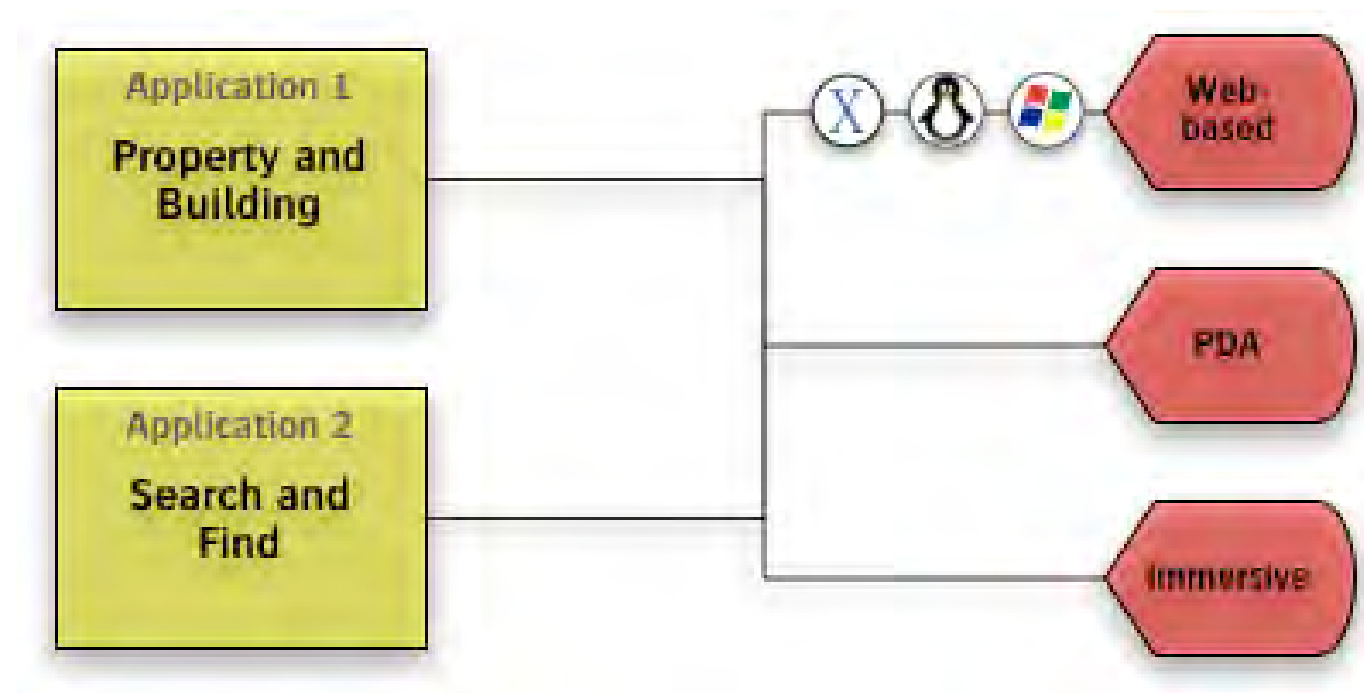
What is GRIFINOR?

- GRIFINOR is a platform for different sorts of applications
- GRIFINOR will be able to store, retrieve, analyze, simplify, generate, and visualize spatial data that are generic 3D
- GRIFINOR will be able to handle "soft" real-time demands as well as being application and device adaptable - that is the system will be module based and object oriented so it can be adapted to PDA's, PC's, mobile units and so on, without requiring alterations to the code of the applications
- GRIFINOR is collaborative so that more than one user per session can experience and interact in the same virtual world
- GRIFINOR is part of a research project and for that reason the users are not specified ahead of time

Processing components



GRIFINOR user-interfaces



Index for Distributed Spatial Object (DSO-index)

- Distributable data structure suitable for indexing 3d objects on world scale
- DSO-index is based on an octree-like data structure
- All nodes and objects are directly or indirectly referenced from the same top node. This top node can be used for arbitrary number of servers
- When used for visualization, the index allows for querying the visually most important objects at a given viewpoint
- The index is used for dynamically changing the fidelity of the visualization according to the capabilities of the hardware and the network as well as user preferences
- Objects can be cached locally and clients can form a peer-to-peer network to relieve object servers

Topographic surface representation indexed using global grid

- For terrain we use a separate index solution
- The indexing transformation uses a method that divides three-dimensional space through a tessellation of a sphere
- This tessellation of a sphere is known as a global grid
- The global grid is a special case of Voronoi tessellation
- Tessellation is made in multiple resolution which is used for indexing LOD

Geo-embedded visual navigation

- Estimate the gravitational up vector at any given position of the user in relation to the globe and aligning the view accordingly
- On a global scale it is more apparent that the navigation works differently, simply because it is more obvious that the world is spherically represented
- Similar to navigation of planar maps, the user can, for example, look over a 3D area, which is actually part of a spherical model; looking down one could zoom-in and zoom-out and pan to any side
- This provides a natural experience for humans and offers a visual navigation and perception at many scales

Summary

- GRIFINOR addresses the need for a global object-oriented solution for browsing geoinformation of many kinds
- Consider this as the engine for future applications within the area of disaster management
- Further research should be done regarding implementation of a better raster engine for the system
- We will soon be able to open for online access to a prototype of GRIFINOR - please contact us if you are interested in this!

Acknowledgements

This initiative under the Centre for 3D GeoInformation is funded by:

- European Regional Development Fund (ERDF) 
- Aalborg University, Denmark
- Kort & Matrikelstyrelsen (Danish National Survey and Cadastre)
- COWI A/S, Denmark (formerly known as Kampsax)
- Informi GIS, Denmark

Thank you!

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